Safety Data Sheet (MSDS)

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifier

- **Product Name**: Battery Grade MnO_2 91% for Zinc-Carbon Cells
- **Product Number**: To be determined (if provided by user)
- **CAS-No.**: 1313-13-9 (Manganese Dioxide)

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

- **Identified Uses**: Cathode material for zinc-carbon batteries
- **Uses Advised Against**: For industrial use only. Do not use for other unauthorized purposes.

1.3 Details of the Supplier of the Safety Data Sheet

- **Company**: BTLnewmaterial
- **Address**: Room 706, No. 154, Wuyi East Road, Niezhou Residential Committee, Caizichi Sub-district Office, Leiyang City, Hengyang City, Hunan Province, China
- **Email**: lixifirm@outlook.com
- **Phone/WhatsApp**: +8618273793022

1.4 Emergency Telephone Number

- **Emergency Phone**: +8618273793022

Section 2: Hazards Identification

2.1 Classification of the Substance or Mixture

Based on available information, this product is not classified as hazardous. However, good industrial hygiene and safety practices should be followed during handling.

2.2 Label Elements

- **Pictogram**: None
- **Signal Word**: None
- **Hazard Statements**: None
- **Precautionary Statements**:
  - **Prevention**: Avoid breathing dust. Use in a well-ventilated area. Wash hands thoroughly after handling.
  - **Response**: If inhaled, remove person to fresh air and keep comfortable for breathing. If feeling unwell, seek medical advice/attention.
  - **Storage**: Store in a cool, dry, and well-ventilated place.
  - **Disposal**: Dispose of contents/container in accordance with local regulations.

2.3 Other Hazards

No other known hazards.

Section 3: Composition/Information on Ingredients

3.1 Substances

Component Name	CAS-No.	Concentration (% w/w)
Manganese Dioxide	1313-13-9	≥ 91.0%

Section 4: First-Aid Measures

4.1 Description of Necessary First-Aid Measures

- **If Inhaled**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
- **In Case of Skin Contact**: Wash thoroughly with soap and plenty of water. Remove contaminated clothing. If irritation persists, get medical attention.
- **In Case of Eye Contact**: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
- **If Swallowed**: Rinse mouth with water. If conscious, give 2-4 cupfuls of milk or water. Do NOT induce vomiting. Get medical attention immediately.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

May cause respiratory irritation, eye irritation, and skin irritation.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Treat symptomatically. Consult a physician if in doubt.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

- **Suitable Extinguishing Media**: Water spray, foam, dry chemical, carbon dioxide.
- **Unsuitable Extinguishing Media**: None known.

5.2 Specific Hazards Arising from the Substance or Mixture

May emit hazardous fumes during combustion.

5.3 Special Protective Equipment and Precautions for Firefighters

Firefighters should wear self-contained breathing apparatus and full protective clothing.

Section 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Avoid dust formation. Ensure adequate ventilation. Wear appropriate personal protective equipment. Evacuate unnecessary personnel.

6.2 Environmental Precautions

Prevent product from entering drains, surface water, and groundwater.

6.3 Methods and Materials for Containment and Cleaning Up

Sweep or shovel into suitable containers for disposal. Avoid dust generation.

Section 7: Handling and Storage

7.1 Precautions for Safe Handling

Handle in a well-ventilated area. Avoid dust formation. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Store in a cool, dry, and well-ventilated place. Keep container tightly closed. Keep away from incompatible materials.

7.3 Specific End Use(s)

Cathode material for zinc-carbon batteries.

Section 8: Exposure Controls/Personal Protection

8.1 Control Parameters

Component Name	CAS-No.	Exposure Limits (PEL/TLV)
Manganese Dioxide	1313-13-9	To be determined (refer to local occupational exposure limits)

8.2 Exposure Controls

- **Engineering Controls**: Use local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. Ensure eyewash stations and safety showers are available in the work area.
- **Individual Protection Measures (PPE)**:
  - **Eye/Face Protection**: Wear safety glasses conforming to national standards.
  - **Skin Protection**: Wear impervious gloves and protective clothing.
  - **Respiratory Protection**: If engineering controls are not sufficient to control airborne concentrations, wear a respirator conforming to national standards.
  - **Body Protection**: Wear appropriate protective clothing to prevent skin exposure.

Section 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

- **Appearance**: Black powder
- **Odor**: Odourless
- **pH**: 5.5 – 7.0 (5% slurry)
- **Melting Point/Freezing Point**: Specific data not available, but manganese dioxide has a high decomposition temperature.

- **Boiling Point/Range**: Not applicable
- **Flash Point**: Not applicable
- **Evaporation Rate**: Not applicable
- **Flammability (solid, gas)**: Non-flammable
- **Upper/Lower Flammability or Explosive Limits**: Not applicable
- **Vapor Pressure**: Not applicable
- **Vapor Density**: Not applicable
- **Relative Density**: 1.8 – 2.3 g/cm^3 (Apparent Density)
- **Solubility**: Insoluble in water
- **Partition Coefficient: n-octanol/water**: Not applicable
- **Auto-Ignition Temperature**: Not applicable
- **Decomposition Temperature**: Specific data not available.
- **Viscosity**: Not applicable
- **Explosive Properties**: Non-explosive
- **Oxidizing Properties**: Non-oxidizing

Section 10: Stability and Reactivity

10.1 Reactivity

Stable under normal conditions of storage and handling.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No known hazardous reactions.

10.4 Conditions to Avoid

Avoid moisture and high temperatures.

10.5 Incompatible Materials

Strong acids, strong reducing agents.

10.6 Hazardous Decomposition Products

May produce toxic fumes under fire conditions.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**:
  - **Oral**: Specific data not available.
  - **Inhalation**: Specific data not available.
  - **Dermal**: Specific data not available.
- **Skin Corrosion/Irritation**: Specific data not available.
- **Serious Eye Damage/Eye Irritation**: Specific data not available.
- **Respiratory or Skin Sensitization**: Specific data not available.
- **Germ Cell Mutagenicity**: Specific data not available.
- **Carcinogenicity**: Specific data not available.
- **Reproductive Toxicity**: Specific data not available.
- **Specific Target Organ Toxicity (Single Exposure)**: Specific data not available.
- **Specific Target Organ Toxicity (Repeated Exposure)**: Specific data not available.
- **Aspiration Hazard**: Specific data not available.

Section 12: Ecological Information

12.1 Toxicity

Specific data not available.

12.2 Persistence and Degradability

Manganese dioxide is an inorganic substance and is not readily biodegradable.

12.3 Bioaccumulative Potential

No known bioaccumulative potential.

12.4 Mobility in Soil

Insoluble in water, low mobility in soil.

12.5 Results of PBT and vPvB Assessment

Assessment not performed.

12.6 Other Adverse Effects

No other known adverse effects.

Section 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product**: Dispose of in accordance with local, regional, national, and international regulations. Do not discharge into drains.
- **Contaminated Packaging**: Dispose of in accordance with local, regional, national, and international regulations.

Section 14: Transport Information

14.1 UN Number

Not applicable.

14.2 UN Proper Shipping Name

Not applicable.

14.3 Transport Hazard Class(es)

Not applicable.

14.4 Packing Group

Not applicable.

14.5 Environmental Hazards

No known environmental hazards.

14.6 Special Precautions for User

During transport, ensure containers are sealed and properly secured to prevent damage and leakage.

14.7 Transport in Bulk According to Annex II of MARPOL and the IBC Code

Not applicable.

Section 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- **National Regulations**: Refer to local regulations regarding chemical safety management, occupational health, and environmental protection.
- **International Regulations**: Refer to international regulations such as REACH, GHS, etc.

Section 16: Other Information

16.1 Revision Date

February 4, 2026

16.2 Further Information

The information in this Safety Data Sheet is based on our current knowledge and is intended to describe the product in terms of health, safety, and environmental requirements. It should not therefore be construed as guaranteeing any specific property of the product.